

CLAIMS

1. A polishing pad comprising a polishing layer and a light-transmissive window member disposed in an opening formed in a part of the polishing layer, wherein the amount of indentation strain (S_1) measured under a load W applied to the light-transmissive window member having an upper area A is larger than the amount of indentation strain (S_2) measured under a load W applied to a region having the area A at any position on the upper surface of the polishing layer.

2. A polishing pad according to Claim 1, wherein $S_1/S_2 \geq 1.5$.

3. A polishing pad according to either Claim 1 or 2, wherein the light-transmissive window member is supported by a highly deformable member.

4. A polishing pad according to Claim 3, wherein the compression modulus of the highly deformable member is 0.001 to 0.8 MPa.

5. A polishing pad according to any one of Claims 1 to 4, wherein at least a part of the light-transmissive window

member is disposed at a position higher than the surface of the polishing layer.

6. A polishing pad according to any one of Claims 1 to 5, wherein the light-transmissive window member has a region having a micro rubber A-type hardness of 60 degrees or less and a region having a rubber microhardness of 80 degrees or more.

7. A polishing pad according to any one of Claims 1 to 6, wherein the light-transmissive window member has a phase separation structure.

8. A polishing apparatus comprising at least the polishing pad according to any one of Claims 1 to 7, means for supplying an abrasive material between the polishing pad and a workpiece, means for making the polishing pad abut on the workpiece and relatively moving the polishing pad and the workpiece to perform polishing, and means for optically measuring the polished state of the workpiece through the light-transmissive window member.

9. A method for fabricating a semiconductor device comprising the step of polishing a surface of the semiconductor substrate using the polishing apparatus

according to Claim 8.

10. A platen hole cover comprising a light-transmissive window member, the platen hole cover being used together with a polishing pad having an opening and fixed on a hole of a platen in a polishing apparatus in which the polished state can be optically measured, wherein the amount of indentation strain ($S'1$) measured under a load W' applied to the upper surface of the light-transmissive window member having an upper area A' is larger than the amount of indentation strain ($S'2$) measured under a load W' applied to a region having the area A' at any position on the upper surface of a polishing layer of the polishing pad used together.

11. A platen hole cover according to Claim 10, wherein $S'1 \geq S'2$.

12. A platen hole cover according to either Claim 10 or 11, wherein the light-transmissive window member is supported by a highly deformable member.

13. A platen hole cover according to Claim 12, wherein the compression modulus of the highly deformable member is 0.001 to 0.8 MPa.

14. A platen hole cover according to any one of Claims 10 to 13, wherein at least a part of the upper surface of the light-transmissive window member is disposed at a position higher than the surface of the polishing layer of the polishing pad before the start of polishing.

15. A platen hole cover according to any one of Claims 10 to 14, wherein the light-transmissive window member has a region having a micro rubber A-type hardness of 60 degrees or less and a region having a micro rubber A-type hardness of 80 degrees or more.

16. A platen hole cover according to any one of Claims 10 to 15, wherein the light-transmissive window member has a phase separation structure.

17. A polishing apparatus comprising:
the platen hole cover according to any one of Claims 10 to 16;
a polishing pad having an opening engageable with the platen hole cover;
means for supplying an abrasive material between the polishing pad and a surface to be polished;
means for making the polishing pad abut on the surface

to be polished and relatively moving the polishing pad and the surface to be polished to perform polishing; and

means for optically measuring the polished state of a workpiece through the light-transmissive window member.

18. A method for fabricating a semiconductor device comprising the step of polishing a surface of a semiconductor substrate using the polishing apparatus according to Claim 17.

19. A method for polishing a workpiece comprising the steps of:

disposing a polishing pad comprising a polishing layer, a light-transmissive window member which constitutes a part of the polishing pad or which is independent of the polishing pad on a platen so that the polishing pad and the light-transmissive window member can abut against the workpiece;

setting the amount of indentation strain ($S''1$) measured under a load W'' applied to the upper surface of the light-transmissive window member having an upper area A'' to be larger than the amount of indentation strain ($S''2$) measured under a load W'' applied to a region having the area A'' at any position on the surface of the polishing layer of the polishing pad; and

supplying an abrasive material between the polishing pad and the workpiece while the polished state of the workpiece is being optically measured through the light-transmissive window member.